

CLAIMS

1. An optical transceiver for transmitting and receiving optical signals of the same wavelength, the transceiver comprising a light source, a light receiver and input – output means for receiving light from and transmitting light to a bi-directional optical transmission path, optical switching means being provided to selectively provide optical communication between the light source and the input-output means and between the input-output means and the light receiver.
2. An optical transceiver as claimed in claim 1 in which the optical switching means comprises an integrated optical switch.
3. An optical transceiver as claimed in claim 2 in which the optical switch comprises at least one phase modulator.
4. An optical transceiver as claimed in claim 3 in which the phase modulator comprises a p-i-n diode.
5. An optical transceiver as claimed in claim 4 in which the optical switch comprises a Mach-Zehnder interferometer.
6. An optical transceiver as claimed in claim 5 in which the Mach-Zehnder interferometer is a four-port interferometer, comprising two four-port couplers.
7. An optical transceiver as claimed in any preceding claim in which the optical switching means can also be arranged to provide selected coupling ratios between the input-output means and the light source and the light receiver.

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8. An optical transceiver as claimed in ~~any~~ preceding claim in which the light source comprises a light emitter.
9. An optical transceiver as claimed in Claim 8 in which the light emitter is a laser diode.
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10. An optical transceiver as claimed in claims 1 to 7 in which the light source comprises a reflector arranged to reflect light received from a remote light source via the input-output means.
11. An optical transceiver as claimed in claim 10 in which the optical switching means is also arranged to modulate light reflected from the reflector.
12. An optical transceiver as claimed in any preceding claim in which the light receiver comprises a photodiode.
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13. An optical transceiver as claimed in any preceding claim in which the input-output means comprises a fibre connector for receiving an optical fibre providing the bi-directional optical transmission path.
14. An optical transceiver as claimed in claim 13 when dependent upon claim 5 in which the fibre connector is optically connected to a single port of the Mach-Zehnder interferometer.
15. An optical transceiver as claimed in claim 14 in which a further light receiver is connected to another port of the Mach-Zehnder interferometer to monitor the output of the transceiver.
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16. An optical transceiver as claimed in claim 13 when dependent upon claim 5 in which the fibre connector is optically connected to two ports of the Mach-Zehnder interferometer via a Y junction.

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17. An optical transceiver as claimed in claim 13 when dependent upon claim 5 in which two ports of the Mach-Zehnder interferometer are each connected to a fibre connector each for connecting, respectively, to first and second optical fibres, each fibre providing the bi-directional optical transmission means.
18. An optical transceiver as claimed in claim 17 when connected to the first and second optical fibres, the first optical fibre being coupled to a ring network so as to transmit signals to the network in a clockwise direction around the network and receive signals therefrom travelling in a counter-clockwise direction around the network and the second optical fibre being coupled to the ring network so as to transmit signals thereto and receive signals therefrom in the opposite directions to the first optical fibre.
19. A transceiver unit for receiving signals of more than one wavelength comprising a wavelength division multiplexer for separating the signals of different wavelengths and an optical transceiver as claimed in any of claims 1 to 17 connected to received signals of a first wavelength from the wavelength division multiplexer.
20. A transceiver unit as claimed in Claim 19 comprising a further receiver for receiving signals of a second wavelength from the wavelength division multiplexer.
21. A transceiver system comprising a central unit connected to a plurality of transceiver units as claimed in Claim 19, the central unit comprising a digital transceiver for communicating with the optical transceiver of each of the transceiver units.
22. A transceiver system as claimed in claim 21 connected to a plurality of transceiver units as claimed in Claim 20, the central unit comprising a digital transceiver for communicating with the optical transceiver of each of
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the transceiver units and a further transmitter for transmitting signals to the further receivers of each of the transceiver units.

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